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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/758,948	01/11/2001	Danan Dou	DP-300744	9639

7590 08/05/2003

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EXAMINER

KUHAR, ANTHONY J

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 08/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 09/758,948	Applicant(s) DOU ET AL.	
Examiner Anthony J Kuhar	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5, 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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## **DETAILED ACTION**

### ***Election/Restrictions***

The examiner withdraws the election of species requirement for both the porous support and for the alkali metal barrier. The examiner will consider all species present for examination purposes.

### ***Specification***

The abstract of the disclosure is objected to because it contains more than 150 words and is more than one paragraph. Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The species ferric oxide, cordierite, alpha-alumina, mullite, tin oxide, and silica are not early transition metal oxides as required by claim 5.

Claims 8-11 are objected to because of the following informalities: "alkali metal barrier loaded on said porous support" is impossible in claim 8 since the alkali metal barrier is *between* the substrate and the absorber (having the porous support) in claim 1. Appropriate correction is required.

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Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 recites that the alkali metal barrier is disposed between the substrate and the absorber, where the absorber comprises a porous support and material loaded on the porous support. Claim 12 recites that the alkali metal barrier is disposed between the substrate and the porous support. However, this would have to be true in claim 1 since the porous support appears to be the bulk material comprising the absorber.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-12 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Deeba '848.

Column 4, lines 7-14 of Deeba '848 teaches a refractory carrier member which may be stainless steel, titanium, alumina, titania, zirconia, or cordierite. Column 4, lines 64-67 teach two

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discrete layers of catalytic trap material placed on the carrier. Column 13, lines 60-67 teach providing a bottom washcoat layer of trap material having an optional platinum catalytic component and a top washcoat layer of trap material having a palladium component. A NO<sub>x</sub> absorbent is applied to both layers by impregnation. Column 14, lines 1-5 teach oxygenated potassium, lithium, or sodium as the NO<sub>x</sub> absorbent. The NO<sub>x</sub> absorbent and catalytic components may be supported by a refractory metal oxide such as alumina, titania, and ceria-alumina. Barium, lanthanum, and other rare earth metals may be included in the refractory support as stabilizers (see column 12, lines 25-45). Example 1 teaches a carrier with a bottom coat of alumina having various catalytic values impregnated therein with a top coat of alumina having various catalytic values impregnated therein. Finally, the double coated carrier is dipped into a potassium solution to load the NO<sub>x</sub> absorbent. Thus, the alkali metal barrier is the bottom coat of refractory oxide impregnated with Group VIII metal, lanthanum, zirconium, or other rare earth metal and the top coat is the porous support having an alkali metal and a NO<sub>x</sub> oxidation catalyst (platinum, palladium, etc.). The ceria and zirconia used in the top coat of example one would act as additional alkali metal barrier. Column 18, lines 1-4 teach 0.08 g/in<sup>3</sup> ZrO<sub>2</sub>, 0.05 g/in<sup>3</sup> La<sub>2</sub>O<sub>3</sub>, and 0.5g/in<sup>3</sup> CeO<sub>2</sub>-ZrO<sub>2</sub> in the alumina.

Claims 1-4, 7, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 09-057099.

JP 09-057099 teaches in the English language abstract a substrate having a first alkali metal coating thereon. A noble metal and an alkali metal are supported over the alkali coating. This prevents diffusion of the first supported alkali metal into the alkali metal layer 10 and to the substrate. In example one of this reference, cordierite as a

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substrate is coated with potassium nitrate solution and dried, forming a first support layer.

Then, silica and alumina slurry was used to coat a porous support of silica and alumina onto the first support layer. Then, this porous support was impregnated with platinum and potassium.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 7, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-156209.

Paragraphs 10-13 of JP 11-156209 teach a honeycomb substrate made of cordierite which is to be coated with a support layer. However, to make the coat layer adhere, aluminum hydroxide or magnesium hydroxide is used to coat the substrate. Paragraph 5 teaches alumina and zeolite as a support. Paragraphs 15 and 16 teaches Pt, Pd, Rh, sodium oxide, lithium oxide, and potassium oxide as materials which are supported. Although the reference does not disclose the coat layer of aluminum or magnesium or sodium hydroxide (see example 1) acts as an alkali metal barrier. However, the reference does teach that the coat layer is used to adhere alumina to the substrate; thus it appears it would also prevent alkali metals from penetrating into the substrate by its adhesive effect.

Claims 1-4 and 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 05-305242 in view of Deeba '848.

The English language abstract of JP 05-305242 teaches a metal substrate having a coating of alumina thereon having alkali or alkaline earth metals. Another layer of alumina supporting noble metals is disclosed. The catalyst is useful for purifying exhaust gas of a car. JP '242 does not teach that the second layer has alkali metals supported thereon. However, column 5, lines 3-6 of Deeba '848 teaches that in a multi-layered catalyst for automobile exhaust gas, a top layer comprises a NO<sub>x</sub> absorbent (alkali metal)

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and catalytic component. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include the NOx absorbent in the same layer as the catalytic metal in JP '242 because the NOx absorbent would absorb the NOx compound during lean operation and then be reduced by the catalytic component during rich operation (see column 6).

Although the total amount of alumina used to coat the substrate is taught, the amount of alumina per unit volume of catalyst is not taught. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the optimum amount of alumina coating because it is not inventive to determine the optimum or workable range which only requires routine experimentation, see *In re Boesch*, 205 USPQ 215.

Claims 1-4 and 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinsky '706 in view of Deeba '848.

Pinsky '706 teaches in column 2 an tin oxide coated acid-resistant substrate for use in various applications. In column 8, lines 12-29, a tin oxide coated substrate is used in catalysis where cordierite is used as the substrate and alumina is coated onto the tin coated substrate. Claims 12 and 13 teach a coating of tin oxide of about 10 microns or less. Column 6, line 61 teaches the use of such catalysts in chemical reduction of nitrogen oxides, however, the alkali and Group VIII metal components used to impregnate the alumina supported on the substrate are not taught. However, Deeba '848 teaches column 5, lines 3-6 a multi-layered catalyst for automobile exhaust gas, a top layer comprises a NOx absorbent (alkali metal) and catalytic component. At the time the



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invention was made, it would have been obvious to one of ordinary skill in the art to use an alkali metal and a Group VIII metal as the catalytic components in the broadly disclosed catalyst of Pinsky '706 because the NO<sub>x</sub> absorbent would absorb the NO<sub>x</sub> compound during lean operation and then be reduced by the Group VIII component during rich operation (see column 6).

Pinsky '706 does not teach the amount of coating per volume of catalyst.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the optimum amount of tin oxide coating because it is not inventive to determine the optimum or workable range which only requires routine experimentation, see *In re Boesch*, 205 USPQ 215.

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 09-057099 as applied to claims 1-4, 7, and 12 above.

The rejection of claims 1-4, 7, and 12 as being anticipated by JP 09-057099 is incorporated herein. Although the concentration of the alkali solution used to coat the substrate is taught, the amount of alkali per unit volume of catalyst is not taught. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the optimum amount of alkali metal coating because it is not inventive to determine the optimum or workable range which only requires routine experimentation, see *In re Boesch*, 205 USPQ 215.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deeba '848 as applied to claims 1-12 and 15 above, and further in view of EP 778072 A2.

The prior art rejection of claims 1-12 and 15 as being anticipated by Deeba '848 is applied herein. Deeba '848 does not teach utilizing a three way catalyst downstream of the absorber or as part of the absorber. However, EP '072 teaches a three way catalyst positioned downstream of a NOx absorber. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to also include a three way catalyst in the process of Deeba because EP '072 teaches a three way catalyst would oxidize any unreacted HC and CO which pass through the NOx trap and catalytic component and provide for NOx conversion during periods of stoichiometric engine operation and during purging of the NOx trap.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 09-057099 as applied to claims 1-4, 7, and 12 above, and further in view of EP 778072 A2.

The prior art rejection of claims 1-4, 7, and 12 as being anticipated by JP 09-057099 is applied herein. JP 09-057099 does not teach utilizing a three way catalyst downstream of the absorber or as part of the absorber. However, EP '072 teaches a three way catalyst positioned downstream of a NOx absorber. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to also include a three way catalyst in the process of JP 09-057099 because EP '072 teaches a three way catalyst would oxidize any unreacted HC and CO which pass through the NOx trap and catalytic component and provide for NOx conversion during periods of stoichiometric engine operation and during purging of the NOx trap.

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Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-156209 as applied to claims 1-4, 7, and 12 above, and further in view of EP 778072 A2.

The prior art rejection of claims 1-4, 7, and 12 as being unpatentable over JP 11-156209 is applied herein. JP 11-156209 does not teach utilizing a three way catalyst downstream of the absorber or as part of the absorber. However, EP '072 teaches a three way catalyst positioned downstream of a NO<sub>x</sub> absorber. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to also include a three way catalyst in the process of JP 11-156209 because EP '072 teaches a three way catalyst would oxidize any unreacted HC and CO which pass through the NO<sub>x</sub> trap and catalytic component and provide for NO<sub>x</sub> conversion during periods of stoichiometric engine operation and during purging of the NO<sub>x</sub> trap.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 05-305242 in view of Deeba '848 as applied to claims 1-4 and 7-12 above, and further in view of EP 778072 A2.

The prior art rejection of claims 1-4 and 7-12 as being unpatentable over JP 05-305242 in view of Deeba '848 is applied herein. Neither reference teaches utilizing a three way catalyst downstream of the absorber or as part of the absorber. However, EP '072 teaches a three way catalyst positioned downstream of a NO<sub>x</sub> absorber. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to also include a three way catalyst in the process of JP 05-305242 because EP '072 teaches a three way catalyst would oxidize any unreacted HC and CO which pass through the

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NOx trap and catalytic component and provide for NOx conversion during periods of stoichiometric engine operation and during purging of the NOx trap.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinsky '706 in view of Deebea '848 as applied to claims 1-4 and 7-14 above, and further in view of EP 778072 A2.

The prior art rejection of claims 1-4 and 7-14 as unpatentable over Pinsky '706 in view of Deebea '848 is applied herein. Neither reference teaches utilizing a three way catalyst downstream of the absorber or as part of the absorber. However, EP '072 teaches a three way catalyst positioned downstream of a NOx absorber. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to also include a three way catalyst in the process of Pinsky '706 in view of Deebea '848 because EP '072 teaches a three way catalyst would oxidize any unreacted HC and CO which pass through the NOx trap and catalytic component and provide for NOx conversion during periods of stoichiometric engine operation and during purging of the NOx trap.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Most of the cited art cannot be used in a rejection due to a later filing or publishing date.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony J Kuhar whose telephone number is 703-305-7095. The examiner can normally be reached on 8:45 am - 5:15 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stan Silverman can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

AK

AK  
July 30, 2003

  
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